

Appl. No. : 09/611,177
Filed : July 6, 2000

and the following comments. Applicant would like to thank the Examiner for the telephonic conference held on May 22, 2002. As a result of the amendments listed above, Claims 18, 27-30, 32-34 have been amended and are presented for further Examination.

The specific changes to the specification and the amended claims are shown on a separate set of pages attached hereto and entitled VERSION WITH MARKINGS TO SHOW CHANGES MADE, which follows the signature page of this Amendment. On this set of pages, the insertions are underlined while the ~~deletions are stricken through~~.

1. Objection to Specification

In the above-mentioned office action, the Examiner pointed out that the specification refers to a Figure 8 and objects to such a reference as no Figure 8 is provided in the drawings. Applicant amended the specification in a response to a previous Office Action to more clearly indicate that the specification is not referring to a drawing, but rather is referring to a commonly recognized pattern. The term "figure 8" refers to a travel in a curved path forming the number "8" and is recognized in aircraft flight, ice skating and race tracks among other things. Applicant respectfully points out that as the specification currently reads, no drawing is referred to, but merely a common flight pattern, and therefore requests that the Examiner withdraw this objection to the specification.

2. Rejections Under 35 U.S.C. § 112

In the above-mentioned office action, the Examiner identified several claims that failed to particularly point out and distinctly claim the subject matter of the invention. Applicant has amended Claims 27-30, 32 and 33 as suggested and respectfully submits that the claims as amended meet the requirements of 35 U.S.C. § 112. Accordingly, Applicant requests withdrawal of this rejection.

3. Rejections Under 35 U.S.C. § 102

The Examiner rejected Claims 24, 26, 27, 32-34, 36, and 37 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,725,956 to Jenkins ("Jenkins"). The Examiner noted that Jenkins discloses a control system for a remote-controlled aircraft with a receiver 26, a control module 35 in communication with the receiver to send out modified signals to a control flight

00 10:02 11:00 FAX
00000011

Appl. No. : 09/611,177
Filed : July 6, 2000

system, and positioning module 15 (Figure 1, and column 3, lines 37-40). The Examiner also stated that the control module is a microprocessor/microcontroller inherently containing memory such as RAM and that it is well known in today's computer technology for such memory to store instructions.

To be anticipatory under 35 U.S.C. § 102, a reference must teach each and every element of the claimed invention. *See Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1379 (Fed. Cir. 1986). "Invalidity for anticipation requires that all of the elements and limitations of the claim are found within a single prior art reference. ...There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention." *See Scripps Clinic & Research Foundation v. Genentech, Inc.*, 927 F.2d 1565 (Fed. Cir. 1991).

Jenkins discloses a system for controlling an aircraft from a ground station via a voice interface for the user. The current position of the aircraft is determined by sensors in the aircraft and this position information is transmitted by an autopilot module to a ground station for display on the ground station instrumentation. *These sensor (telemetry) signals are not used to control the flight path of the aircraft.* In Jenkins, user-provided voice control signals transmitted from the ground are translated directly into control signals *with no input whatsoever from the telemetry*, and these control signals are what control the flight of the aircraft.

In contrast, Applicant's claims relate to a system that modifies the control signals from the transmitter by taking telemetry input from the sensors on the aircraft. Independent Claim 24 recites a control module that receives control signals from the ground and positioning signals from the aircraft's position sensors, and is "adapted to output modified control signals... based on the received control signals *and received positioning signals.*" Thus, the recited control module reviews the transmitted control signals received from the ground and compares them to the current telemetry of the aircraft. If the control module determines that the transmitted control signals will put the aircraft in an unsafe flight mode for the current flight attitude, the control module modifies the received control signals to position the aircraft in a safer configuration. Claim 34 similarly recites that the control module *utilizes the transmitted control signals and the position signals to output modified control signals* to at least one flight control system.

There is no teaching in Jenkins of utilizing the telemetry data of the aircraft to modify the control signals transmitted to the flight control system. To the contrary, Jenkins teaches away

00:10:02 11:00 FAX

Appl. No. : 09/611,177
Filed : July 6, 2000

from such use of the telemetry in column 3, lines 10-15, 37-41 and 48-51, which all indicate that the telemetry data generated in the aircraft is only transmitted by the autopilot to the ground receiver for display on a flight gauge, and *not* used by the autopilot to position the control surfaces of the aircraft. Hence, Applicant respectfully submits that independent Claims 24 and 34 are not anticipated by Jenkins. Moreover, dependent Claims 25-33 and 35-40 would also not be anticipated by Jenkins as they depend from claims not anticipated by Jenkins. For these reasons, Applicant respectfully requests withdrawal of all rejections under 35 U.S.C. § 102.

2. Rejections Under 35 U.S.C. § 103

In the above-mentioned office action, the Examiner rejected Claims 18-21, 23, 25, 29-31, 35, 39 and 40 under 35 U.S.C. § 103(a) as being unpatentable over Jenkins in view of U.S. Patent No. 4,206,411 to Meyer ("Meyer"). The Examiner argued that Jenkins disclosed all parts of the invention except pulse-width modulated signals and the modified guidance signals that result in the aircraft entering a predetermined flight pattern in case of an emergency. The Examiner also argued that Meyer disclosed pulse-width modulated signals and modified guidance signals that change the flight pattern of the aircraft to a predetermined flight pattern in case of emergency or any other situations. The Examiner concluded that, "[i]t would have been obvious to one skilled in the art at the time the invention was made to have used pulse-width modulated signals and a computerized system in which modified guidance signals... change the flight pattern of the aircraft to a predetermined flight pattern in case of an emergency... to prevent the aircraft from crashing."

To establish a *prima facie* case of obviousness a three-prong test must be met. First, there must be some suggestion or motivation, either in the references or in the knowledge generally available among those of ordinary skill in the art, to modify the reference. Second, there must be a reasonable expectation of success found in the prior art. Third, the prior art reference must teach or suggest all the claim limitations. *In re Vaack*, 947 F.2d 488 (Fed. Cir. 1991).

Meyer discloses a system in a remotely controlled aircraft for responding to a loss of control signal from the remote control transmitter. The on-board control system measures characteristics of the flight control signals sent from the transmitter and when those characteristics fall out of a predetermined range, the control system replaces them with preprogrammed control signals to put the aircraft in a safe flight pattern.

09/10/02 11:07 FAX
Appl. No. : 09/611,177
Filed : July 6, 2000

However, as discussed above, Jenkins does not disclose a system that uses positioning signals corresponding to the attitude of the aircraft to modify control signals sent by a ground transmitter, as recited in Claims 18, 24 and 34.

Meyer does not correct this deficiency. Meyer simply describes a system that switches between pilot control and automated control when the aircraft stops receiving control signals.

Since neither Meyer nor Jenkins teach this element, their combination could not render the claims obvious. Moreover, neither reference provides a motivation or suggestion to allow the on-board flight control module to utilize telemetry signals to modify the control signals that are sent to the aircraft flight control systems. Therefore, Applicant respectfully submits that independent Claims 18, 24 and 34 and any claims depending from them are patentable under 35 U.S.C. § 103(a), and respectfully requests allowance of those claims.

The Examiner also rejected dependent Claim 22 under 35 U.S.C. § 103(a) over Jenkins in view of Meyer and further in view of U.S. Patent No. 4,821,572 to Hulsing ("Hulsing").

Hulsing discloses a multi-axis accelerometer that measures acceleration in various axes. The Examiner argued that it would have been obvious to one skilled in the art at the time of the invention to have used Hulsing's accelerometer in Jenkin's system "to allow the aircraft to determine its own acceleration." However, as discussed above, the combination of Jenkins and Meyer could not render these claims obvious. Accordingly, adding Hulsing does not make these claims obvious. For this reason, Applicant respectfully requests withdrawal of this rejection.

The Examiner also argued, in rejecting Claim 31, that it would be obvious to one skilled in the art at the time the invention was made to align the pulse modulated signals received by the aircraft at their leading edge. However, the Examiner did not state any source for, or examples of, such common knowledge in the art. Moreover, the Meyer reference specifically illustrates the pulse-width modulated signals in series in Figure 1, and not aligned at their leading edge. Contrary to M.P.E.P. § 706.02(j), the Examiner summarily dismisses a significant advance in the field of remote aircraft piloting, and failed to provide the proposed modification to Meyer to align the leading edges of the aircraft control signals, as such alignment is not expressed or implied in Meyer. The Examiner also failed to provide any motivation to make the proposed modification, which is also required by M.P.E.P. § 706.02(j), other than to say that the modification is "to allow the aircraft to fly as desired by the pilot." (Office Action page 4) Applicant respectfully submits that there is no modification disclosed in Meyer to align the

Appl. No. : 09/611,177
Filed : July 6, 2000

leading edge of the signals received in series, and no motivation exists either in Meyer or the knowledge of those of ordinary skill in the art to perform any such modification. For this reason, Applicant respectfully requests withdrawal of this rejection.

CONCLUSION

Applicant has endeavored to address all of the Examiner's concerns as expressed in the outstanding Office Action. Accordingly, amendments to the claims for patentability purposes pursuant to statutory sections 102, 103 and 112, the reasons therefore, and arguments in support of the patentability of the pending claim set are presented above. Any claim amendments which are not specifically discussed in the above remarks are not made for patentability purposes, and it is believed that the claims would satisfy the statutory requirements for patentability without the entry of such amendments. Rather, these amendments have only been made to increase claim readability, to improve grammar, and to reduce the time and effort required of those in the art to clearly understand the scope of the claim language.

In light of the above amendments and remarks, reconsideration and withdrawal of the outstanding rejections is specifically requested. If the Examiner finds any remaining impediment to the prompt allowance of these claims, Examiner is respectfully requested to contact the undersigned at the Examiner's earliest convenience.

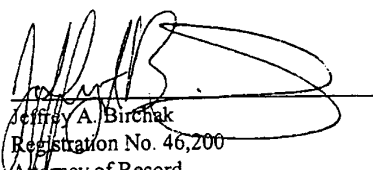
Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 13 June 2002

By:


Jeffrey A. Birchak
Registration No. 46,200
Attorney of Record
620 Newport Center Drive
Sixteenth Floor
Newport Beach, CA 92660
(619) 235-5880

Appl. No. : 09/611,177
Filed : July 6, 2000

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

18. (Amended) A method of modifying ~~the~~ a flight pattern of a remote controlled aircraft, comprising:
- reading control signals from a transmitter;
 - reading positioning signals corresponding to ~~the~~ current attitude of said aircraft from a positioning module;
 - determining, based on said current attitude, if said control signals will place ~~the airplane~~ said aircraft in a flight or pattern outside of defined performance parameters; and
 - modifying said control signals so that ~~performance of said aircraft~~ said flight pattern is within said defined performance parameters.
27. (Amended) The ~~guidance system~~ control system of Claim 24, wherein said aircraft flight control system is selected from the group consisting of: a servo, an engine, a rudder, an aileron and an elevator.
28. (Amended) The ~~guidance system~~ control system of Claim 24, wherein said positioning module comprises an accelerometer.
29. (Amended) The ~~guidance system~~ control system of Claim 24, wherein said control module is further adapted to provide modified guidance signals to said flight control system that place said aircraft in straight and level flight.
30. (Amended) The ~~guidance system~~ control system of Claim 24, wherein said control module is further adapted to provide modified guidance signals to said at least one flight control system that result in said aircraft entering a predetermined flight pattern.
32. (Amended) The ~~guidance system~~ control system of Claim 24, wherein said control module comprises instructions that are stored in a memory.
33. (Amended) The ~~guidance system~~ control system of Claim 32, wherein said memory is selected from the group consisting of a Random Access Memory (RAM), a Read Only Memory (ROM), an Erasable Programmable Read Only Memory (EPROM) and an Electrically Erasable Programmable Read Only Memory (EEPROM).
34. (Amended) A system for preventing crashes of a remote controlled aircraft, comprising:

BEST AVAILABLE COPY

Appl. No. : 09/611,177
Filed : July 6, 2000

a receiver for receiving control signals from a transmitter;
a positioning module that provides positioning signals representing the an attitude
of the remote controlled aircraft; and

a control module ~~that receives~~ adapted to read said control signals and said
positioning signals, ~~and is adapted~~ to output modified control signals to at least one flight
control system of the ~~said remote controlled~~ remote-controlled aircraft in order to reduce
~~said a~~ risk of crashing said aircraft.

S:\DOCS\UZBUZB-1551.DOC
052202

BEST AVAILABLE COPY